

# *Fire as a Management Tool in Arkansas From Concept to Implementation*



# Discussion Topics

- **Role of Fire in our Ecosystems**
- **Why we burn in Arkansas?**
- **Partnerships and Collaborations**
- **Future Directions**

# Part I: How fire shaped Arkansas



# Background For Restoring and Managing

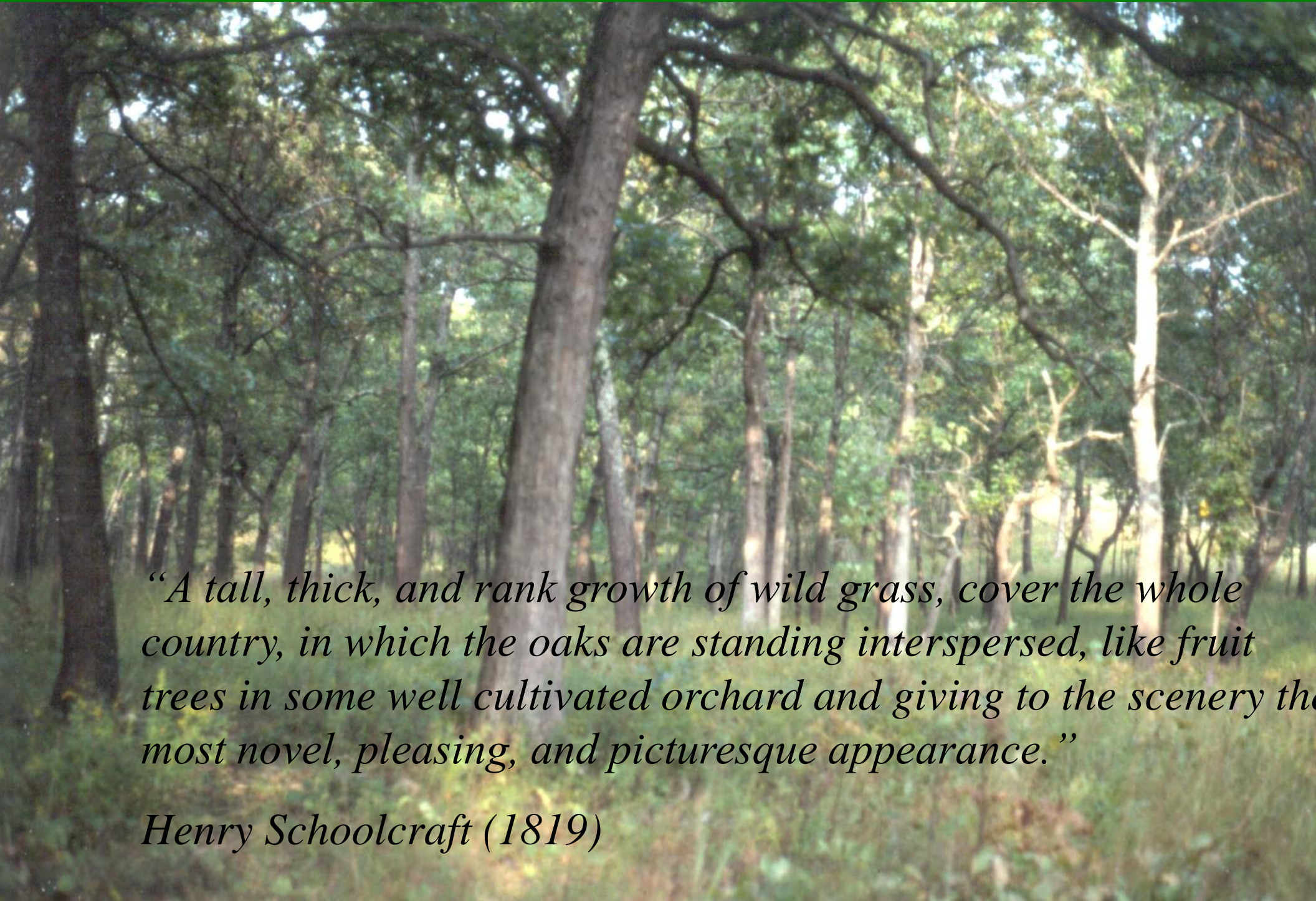
## Shortleaf Pine and Oak Forests

*“The Interior Highlands evolved under 12,000 years of natural and human induced fires”*

-Tom Foti, Arkansas Natural Heritage Commission



## *Early Accounts of the Landscape.....*



*“A tall, thick, and rank growth of wild grass, cover the whole country, in which the oaks are standing interspersed, like fruit trees in some well cultivated orchard and giving to the scenery the most novel, pleasing, and picturesque appearance.”*

*Henry Schoolcraft (1819)*



# *Ouachita Mountain - Shortleaf Pine Woodlands*



# *Ozark Mountain - Oak Pine Woodlands*





# *Surface Fires*

## *Mixed Severity /Low Intensity*



Photo: FM9 Head Fire by McRee Anderson

# Historical Fire Burned At Landscape Scale Low Intensity Surface Fires



# Fire history of oak–pine forests in the Lower Boston Mountains, Arkansas, USA

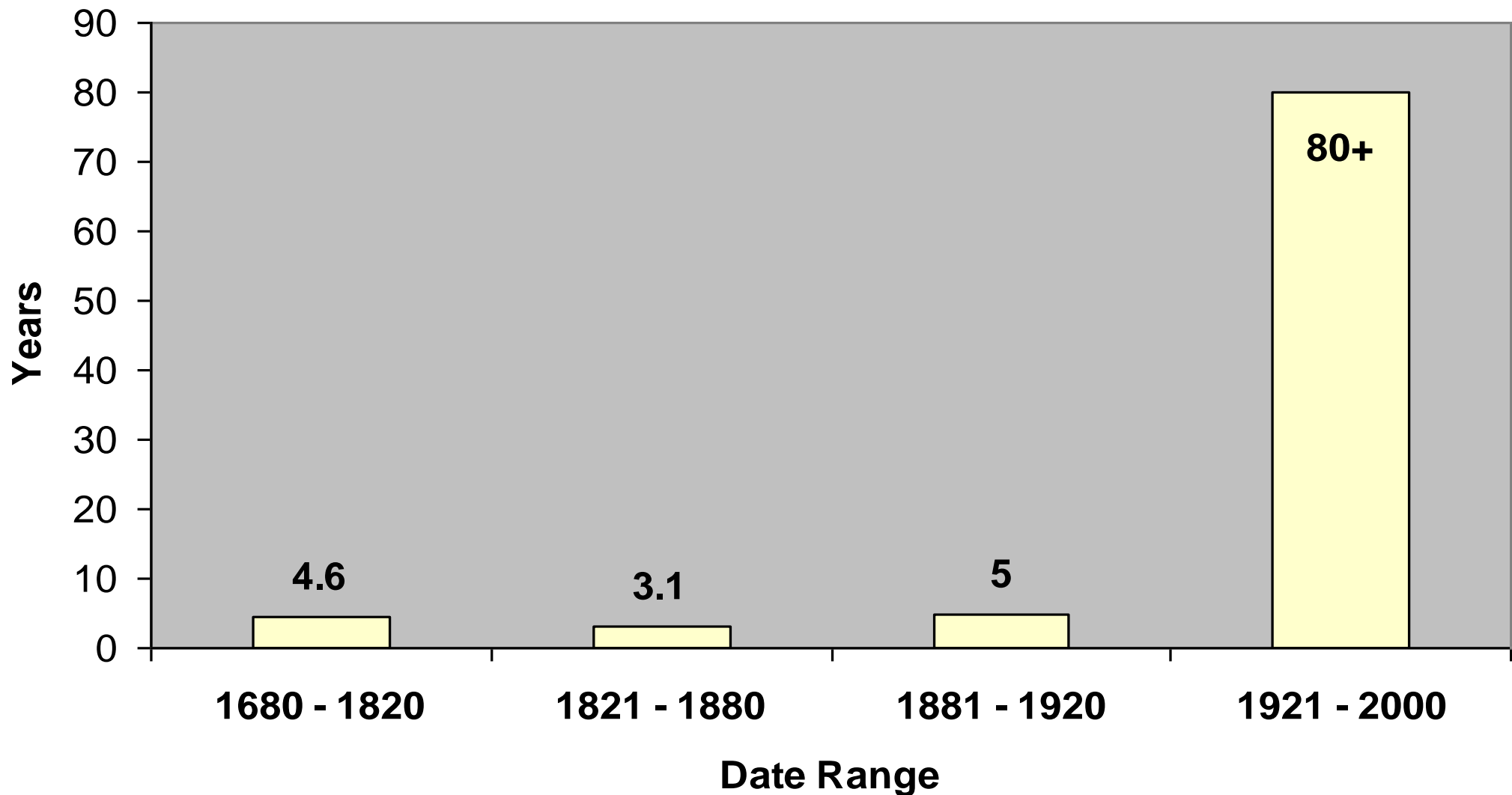
*R.P. Guyette and M.A. Spetich, 2003*



*Fire history of oak–pine forests in the Lower  
Boston Mountains, Arkansas, USA  
Guyette and Spetich, 2003*

**Fire Return Interval**

*(Guyette and Spetich, 2003)*



# Upland Hardwood Forests and Related Communities of the Arkansas Ozarks in the Early 19<sup>th</sup> Century

Thomas L. Foti (2001)

in

Upland Oak Ecology Symposium:  
History, Current Conditions, and Sustainability

***Ozark Mountains***  
***44 - 78 Trees/Acre***

***1.5M Acres***  
***Woodlands***





John Andre



Photo: Ouachita NF circ 1920

192192

# Current Ecosystem to Manage!









Some days we just get stuck, and bogged down.  
Some days all you can do is smile and wait for someone to kindly  
remove your butt from the hole you find it wedged into.



Part II: Why We Burn?

Fire management goals

# Arkansas Prescribed Fire Council

*To facilitate communication between landowners and service providers, to provide reliable and consistent information on the tools and use of prescribed fire, and to provide a forum for the discussion of issues regarding prescribed fire in Arkansas.*

- Started 1997!      10 Partner Agencies  
Bi Annual Meetings      Bylaws Drafted



# Arkansas Prescribed Fire Council

## State and Federal Training!

- Prescribed Fire as a Management Tool Course
- 5 day course – Burn Plan Prep and 2 RX burns
- 600 Students Since 1997!



# Cooperative Fire Management

Focus on Hi Profile Sites!



# Cooperative Fire Management Team Effort





**Fuel reduction.**





**To reduce forest densification.**



**Post-logging slash removal.**



**Integrated thinning of both the  
overstory and midstory.**

**To propagate a herbaceous layer.**



Site Preparation



# Native Plant Restoration

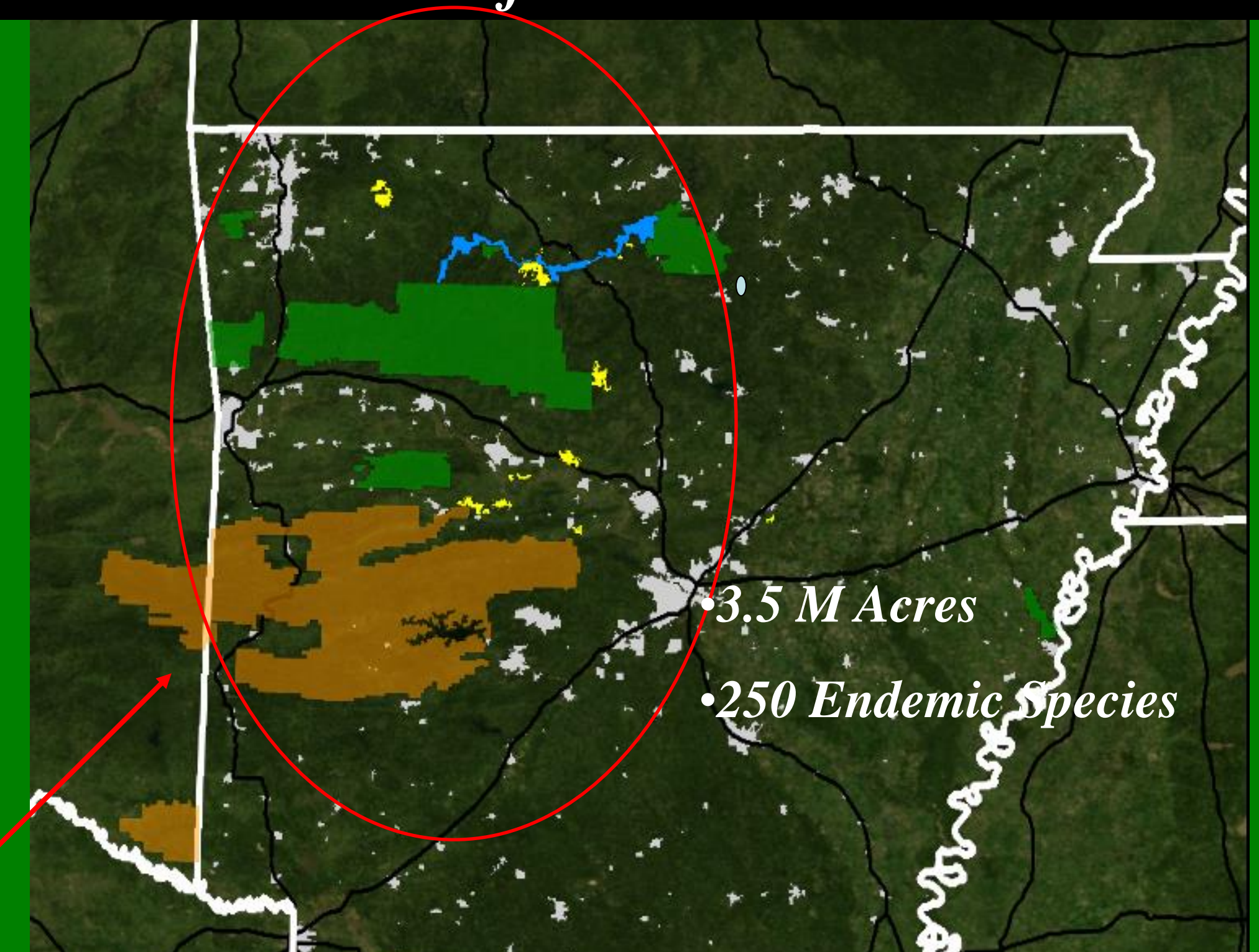
**Unburned**

**Burned**

# Rare species



# *Shortleaf Pine Oak Woodlands*









# *Interior Highlands Collaborative Strategy*

**Management:** Promote sustainable long-term management across the region with key demonstration areas maintained across the region.

**Science:** Integrate ecological science and monitoring into management activities.

**Public Engagement:** Actively engage the public through conventional and new multi-media platforms that enhances public knowledge of ecological restoration.

**Policy:** Address multi-level policy challenges and/or opportunities related to woodland restoration and management.

**Funding/Capacity:** Secure funding to maintain generational woodland restoration on public, private and state lands.

Workshop # 3



# *Last Season!*

## *Annual Targets -- The Ecological Math?*

**3.6M acres = Short Interval Fire**

### **Regimes**

**FY 2000**

**FY 2015**

**FY2016**

**Ozark 3,000**

**80,000 acres**

**30,000 acres**

**Ouachita 31,000**

**120,000 acres**

**70,000 acres**

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**34,000**

**200,000**

**100,000 acres**

### **Future???**

**The Ozark-St. Francis - 250,000 acres**

**The Ouachita NF - 400,000 acres**

# *Average Fire Numbers*

•USFS	200,000 acres
•TNC	12,000 acres
•ARGFC	15,000 acres
•ARFC	4,000 acres
•State Parks	2,100 acres
•Private	7,000 acres
•Total	260,000 acres



# *Multiple Projects Ongoing.....*

- **Landscape-Scale NEPA -HAPPY Bat Project 80,000 Acres**
  - *7,000 Acres Woodlands YR*
  - *15K YR Burning*
  - *Ecological Assessment – Glades*
    - *SWG Grant for 500 acres of glade restoration*
- **2 CFLRP Projects Funding Opportunities**
  - *CFLRA Feds \$1.5M*
  - *8,000 Acres Woodlands YR*
- **Joint Chief Awards Ongoing**
  - *\$1.5M*
- **Landscape-Scale Plant Community Monitoring**
- *RX Fires – 200+K Acres 70K Ozarks, 130K Ouachita*

# CFLRP Projects

Ozark-St. Francis National Forest

Collaborative Forest Landscape Restoration Program (CFLRP)

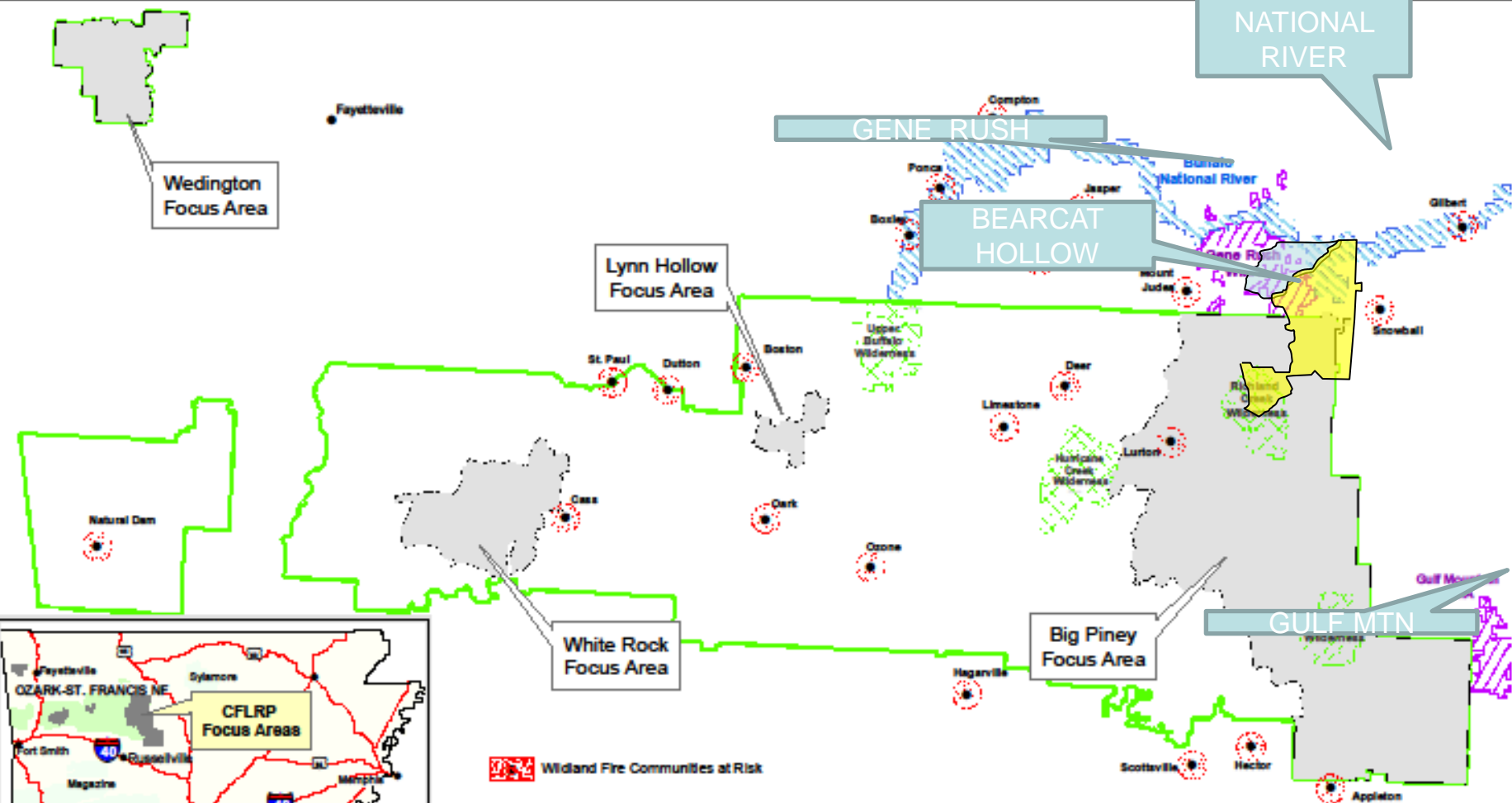


Rocky Mountain Elk Foundation  
ensuring the future of the elk and bison



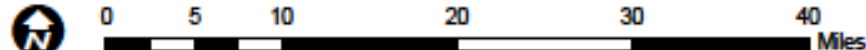
Arkansas  
Department of  
Agriculture

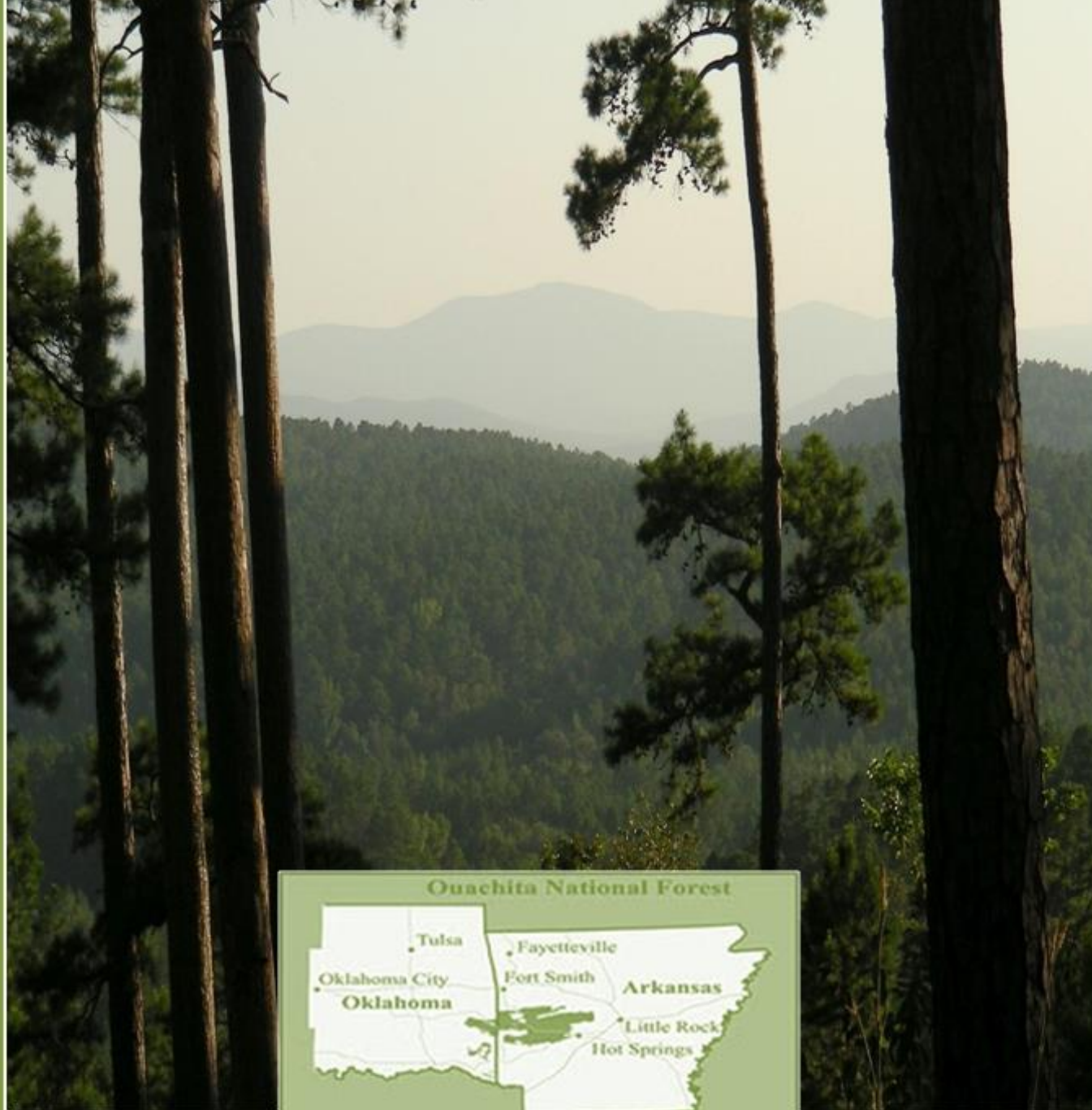
Ownership and Focus Areas Map



- Wildland Fire Communities at Risk
- State Wildlife Management Areas
- Buffalo National River
- Wilderness
- CFLRP Focus Areas

Total area of the landscape – 344,393 acres  
Total area receiving treatment – 217,892 acres

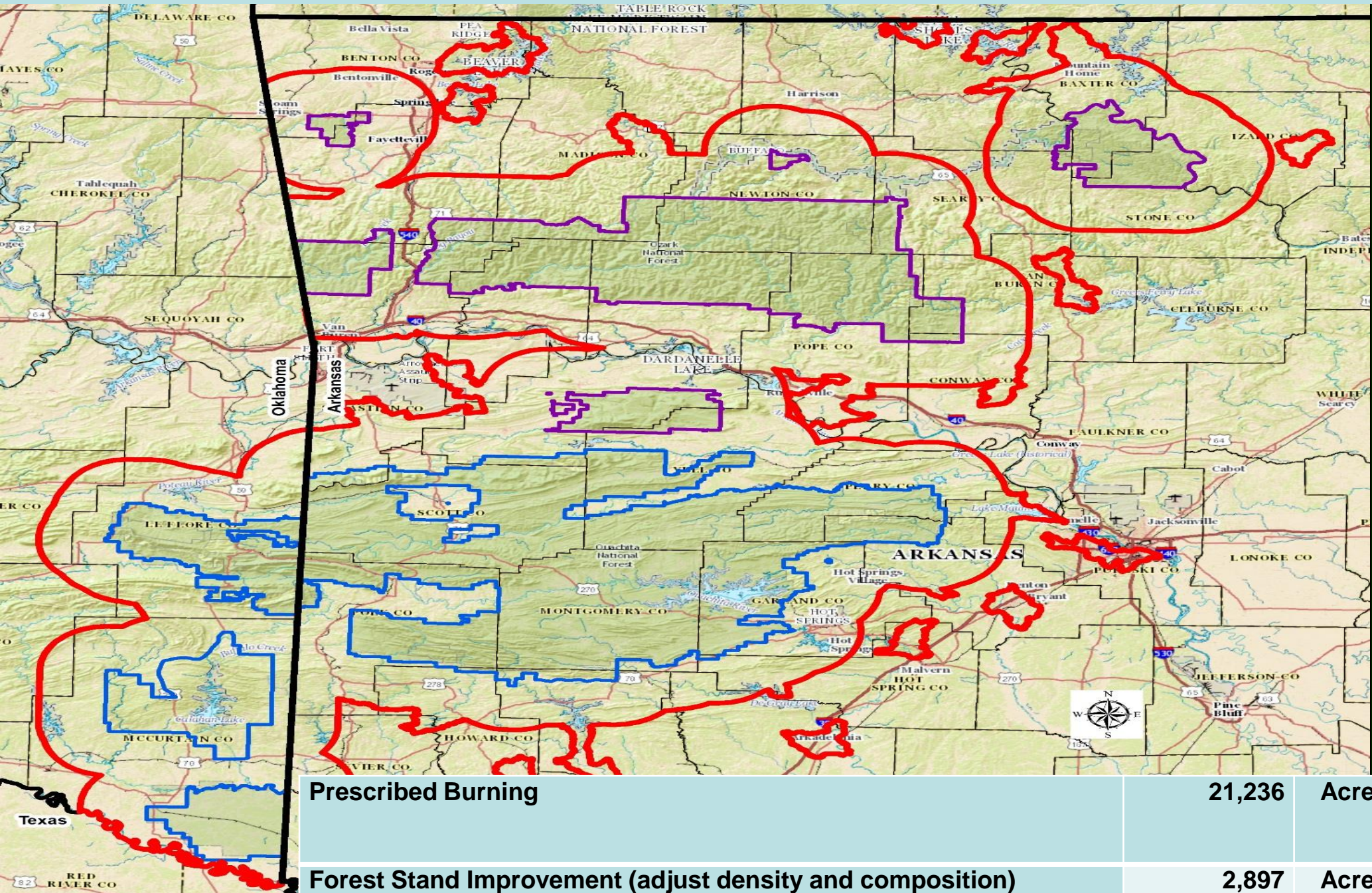




**SHORTLEAF-BLUESTEM COMMUNITY**  
**Ouachita National Forest**  
**Arkansas-Oklahoma**



# Joint Chiefs Private Lands Initiative



Prescribed Burning

21,236 Acres

Forest Stand Improvement (adjust density and composition)

2,897 Acres

Tree/Shrub Establishment (tree planting)

8,914 Acres

# “Grocery” or Species Diversity



**Benefits**

**Water Quality, Soil Stability,  
Nutrients**

# Ecosystem Health and Sustainability



# Restored Ecosystem = Healthy System

**Herbaceous Diversity - 100- 150 species/ acre**

**Tree Density - 38-76 trees/ acre**

# Community Engagement is about Tours!

6 tours, 100+ participants



# Community Engagement

5- Forest Resiliency/Restoration Panels

2-Glade Restoration Panels





# Healthy Forest Management is Working!





# Restoration is Working!

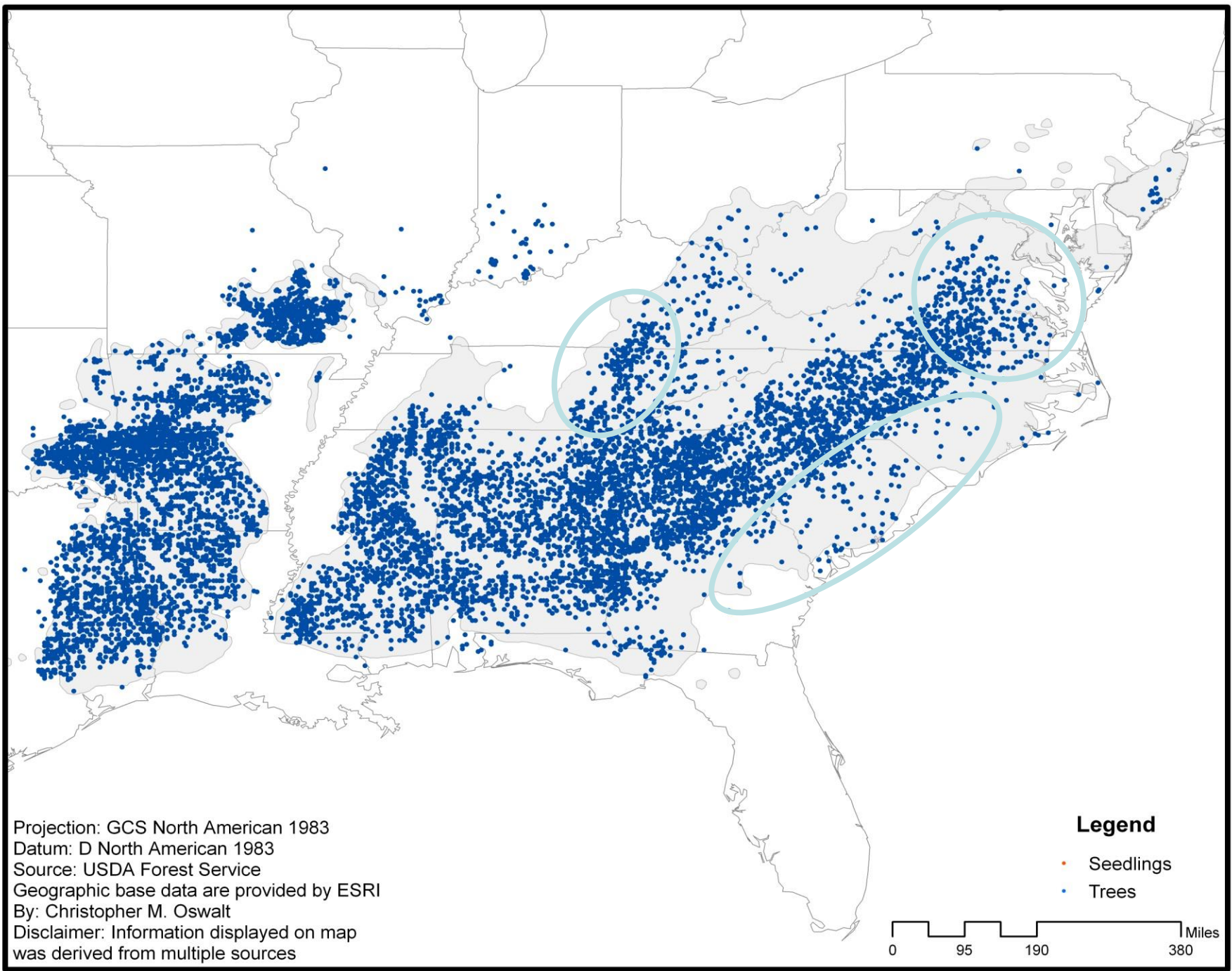


# Shortleaf Pine

## INITIATIVE



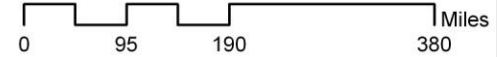
RESTORING AN AMERICAN FOREST LEGACY



Projection: GCS North American 1983  
Datum: D North American 1983  
Source: USDA Forest Service  
Geographic base data are provided by ESRI  
By: Christopher M. Oswalt  
Disclaimer: Information displayed on map  
was derived from multiple sources

**Legend**

- Seedlings
- Trees





# Questions ?

Photo: Oak Woodlands, Bayou Ranger District, John Andre



# Questions ?

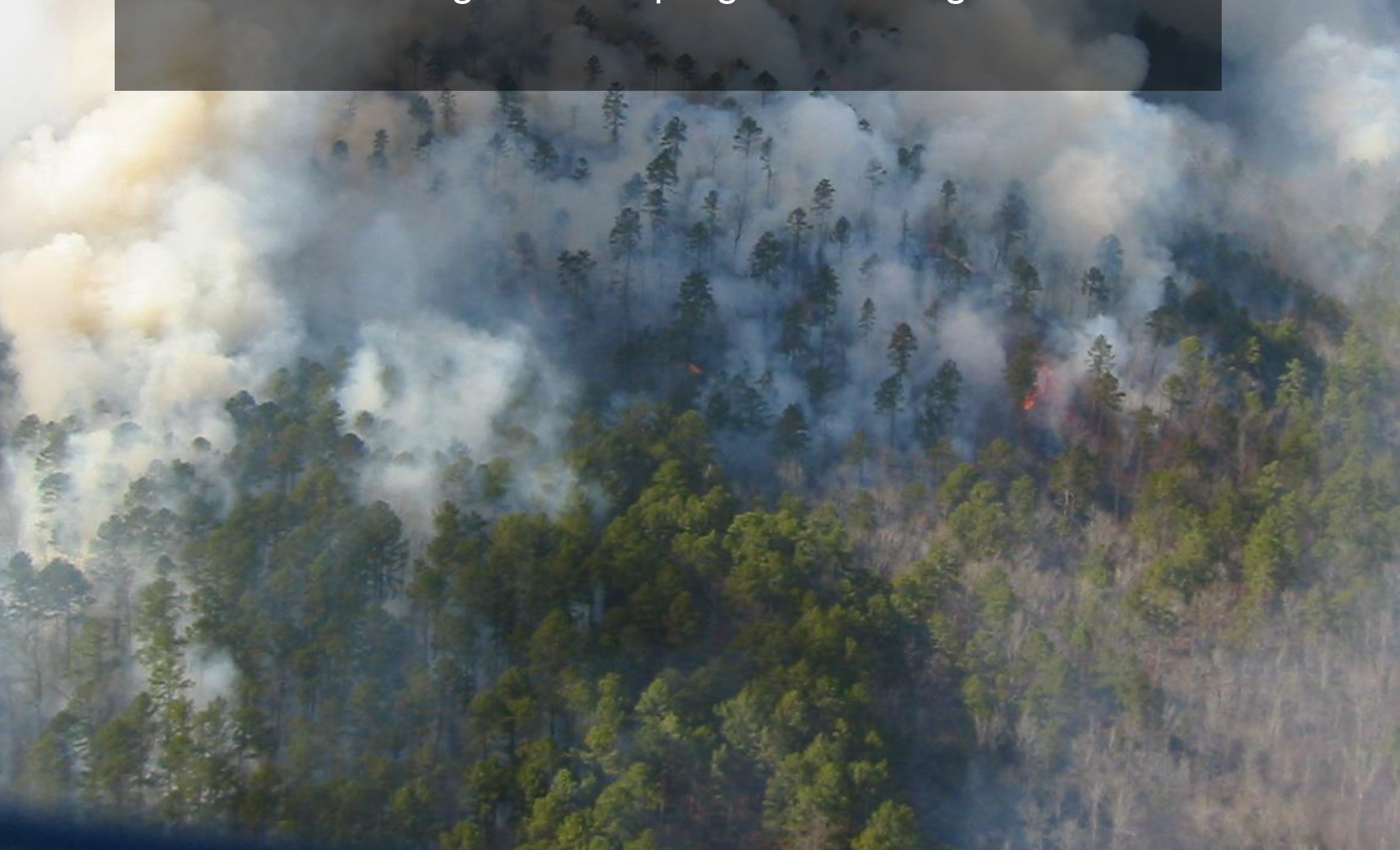
Photo: Oak Woodlands, Bayou Ranger District, John Andre

# RX Fire Partnership! –Record Season

200,000+ Acres

8,000+ Acres (TNC-USFS)

NPS Regional Coop Agreement Signed



# Pine/Oak Woodland Management

## 15,000+ Acres

(Timber, WSI etc)





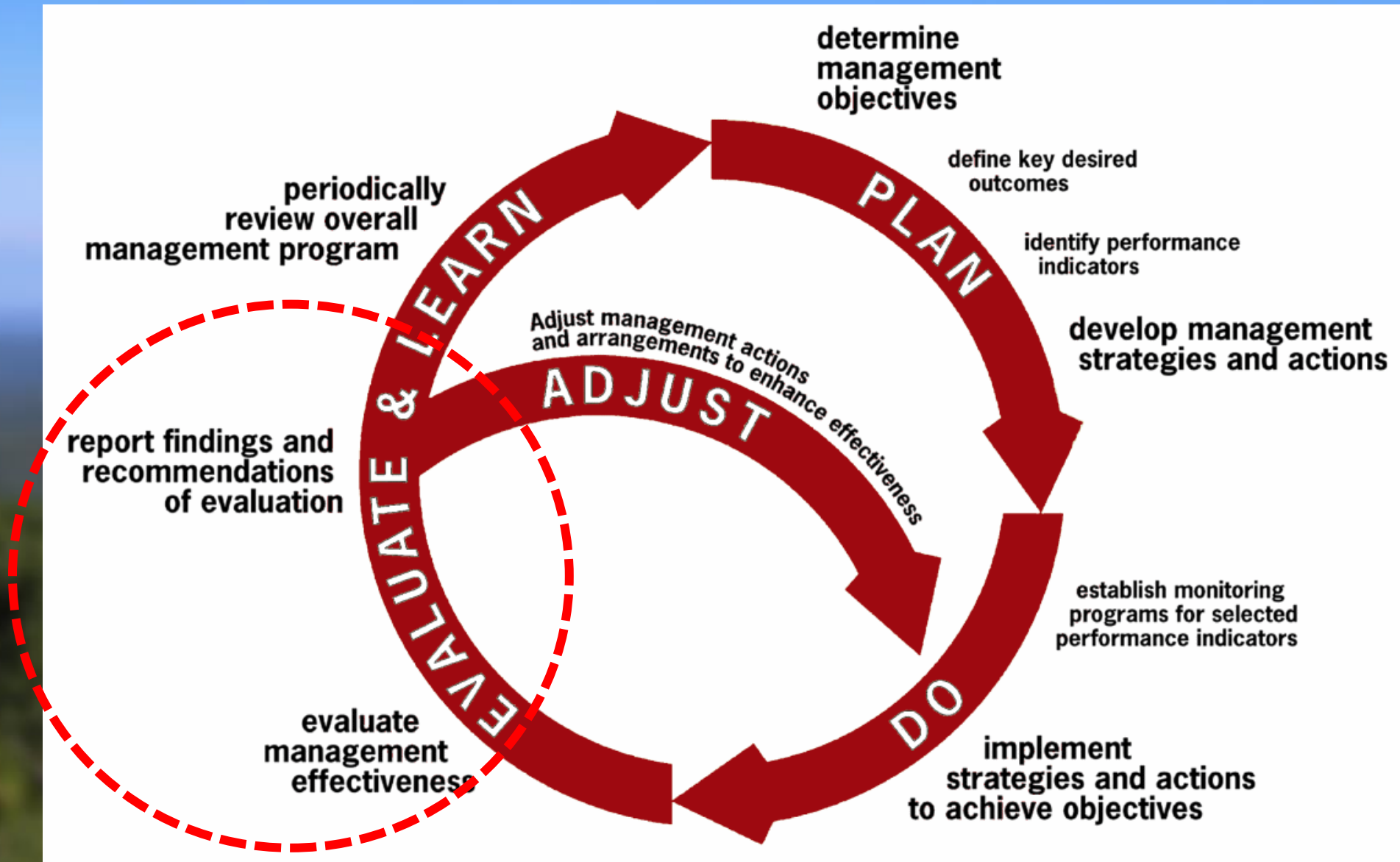


# Restored Fire Regime (Frequency/Seasonality)



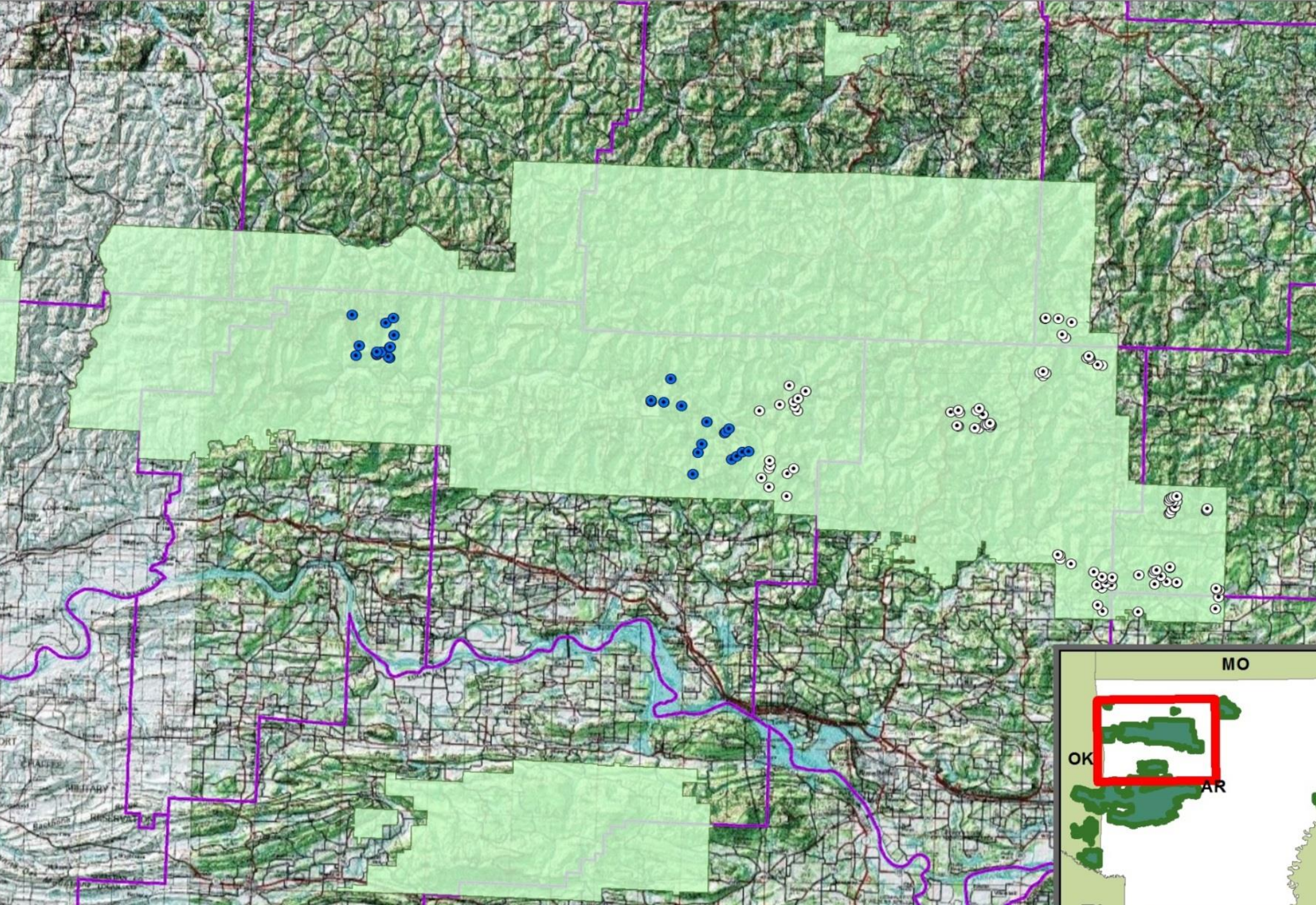
Photo: LBL, KY by Jim McCoy

# • Interior Highlands Collaborative Strategy



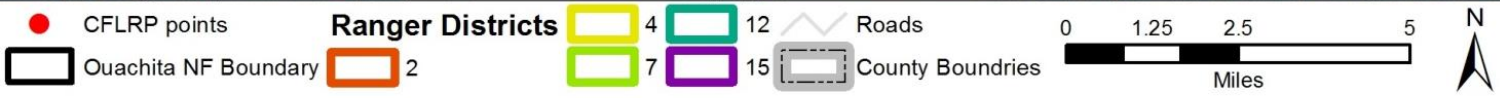
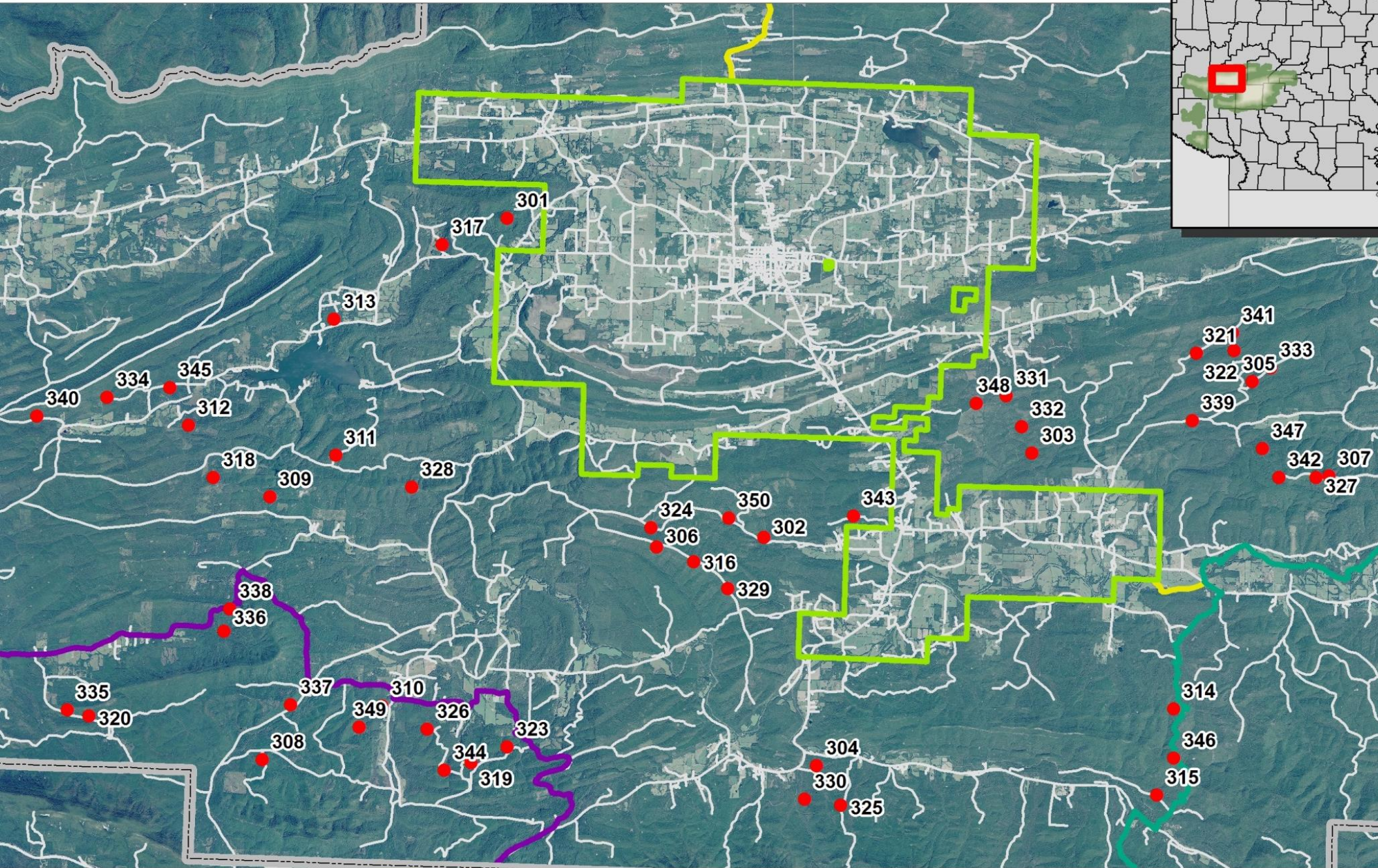
**Monitoring**

**Ozark-St Francis National Forest  
Monitoring Macro Plots  
Ozark Ecoregion - Arkansas**



# Ouachita National Forest - Ranger Districts in AR

## CFLRP June 2012 -- 50 Points

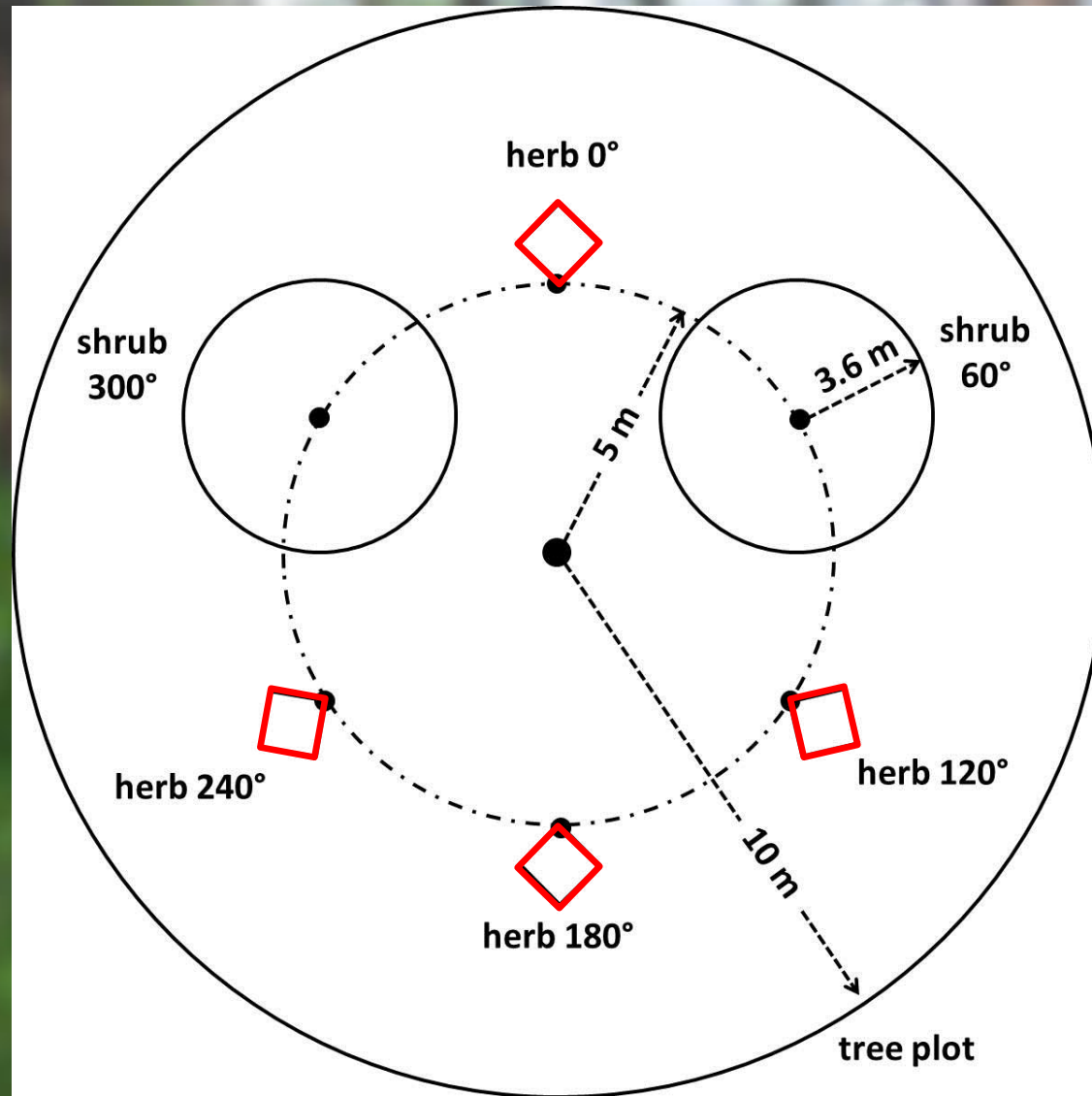


# Cooperative Monitoring

50 CLFR Plots this summer  
1- Monitoring Report Completed



# Macroplot



ground layer

# *“Monitoring Allows Project Teams To...”*

**Quantify Treatment Results**

**Adjust Fire Regime**

**Adjust Timber Harvest**

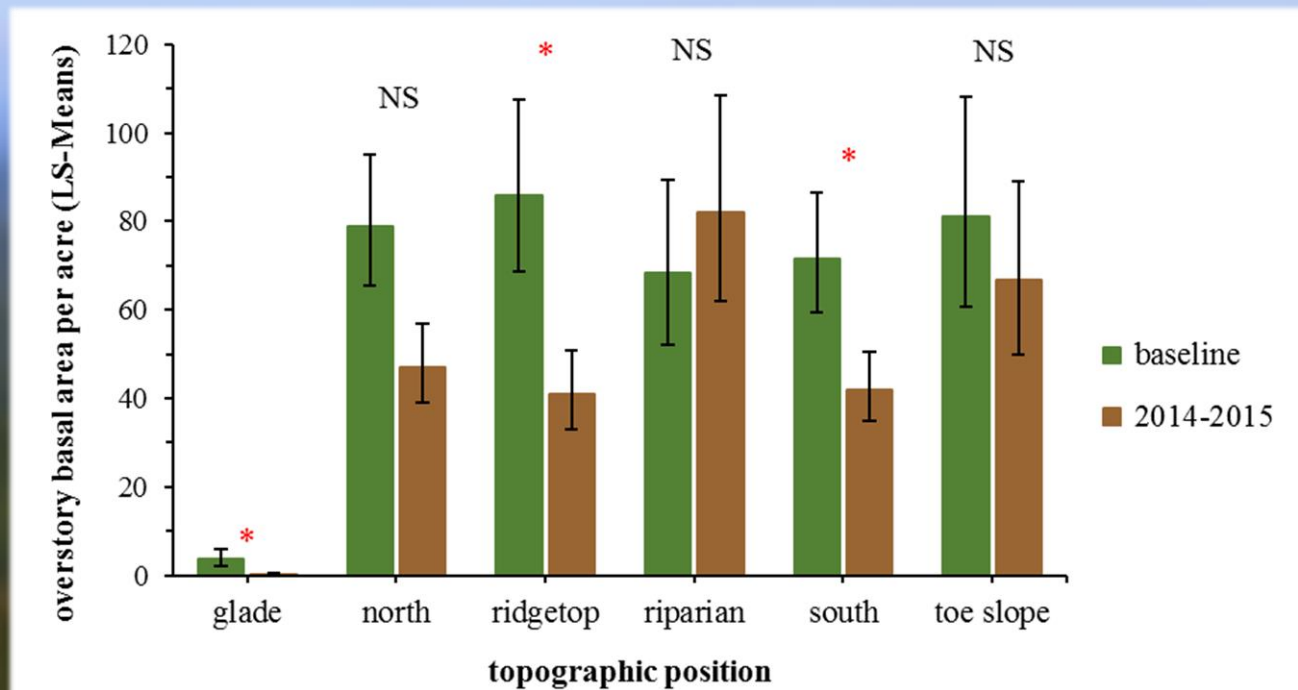
**Adjust Mid Story Treatments**



# Topographic position

## *Changes over time*

### Overstory basal area (ft<sup>2</sup>/acre)

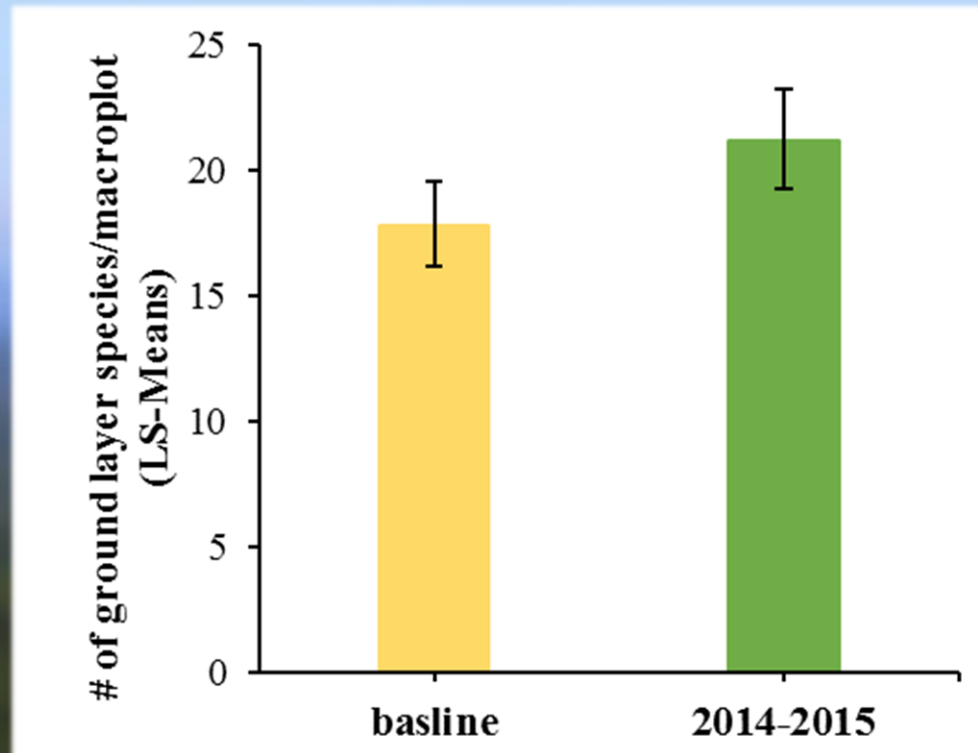


**Figure 12.** There were significant changes in overstory BA between years, depending on topographic position (df = 116, F = 2.88, p = 0.017). Thick bars are least-squares means from the model. Error bars are standard errors. Asterisks (\*) indicate a statistically significant difference ( $\alpha = 0.05$ ) in overstory BA between years, within a given topographic position (otherwise, NS = not significant).



# All plots

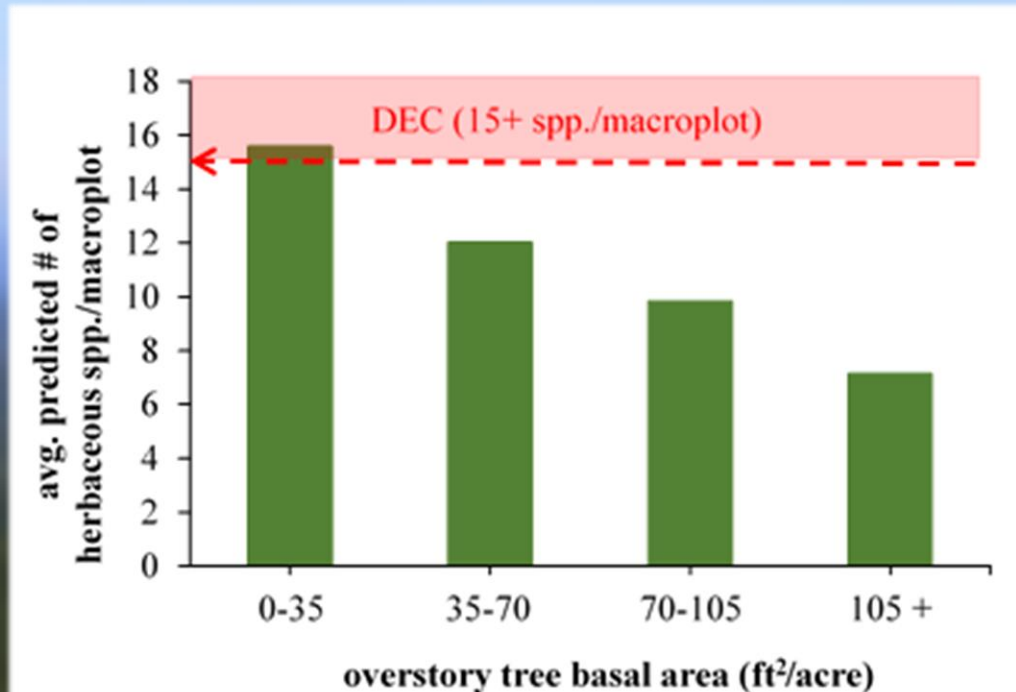
## Avg. # ground layer spp./plot



**Figure 9.** There was a significant increase in the number of ground layer species per macroplot between baseline and 2014-2015 ( $df = 110$ ,  $F = 6.73$ ,  $p = 0.0108$ ). Thick bars are least-squares means from the model. Error bars are 95% confidence intervals.

# Best predictors

## Avg. # herbaceous spp./plot



**Figure 4.** Overstory basal area was one of the best predictors of herbaceous species richness per macroplot in 2014-2015 (model selection based on AIC). There was a significant decrease in herbaceous species richness per macroplot with increasing overstory basal area (ft<sup>2</sup>/acre) (df = 110, F = 22.29, p = < 0.0001).

# *“Is our Fire Regime Appropriate??”*







*“Are We Using All the Tools??”*



# *“Are We Losing the Battle??”*

## Shrub Development



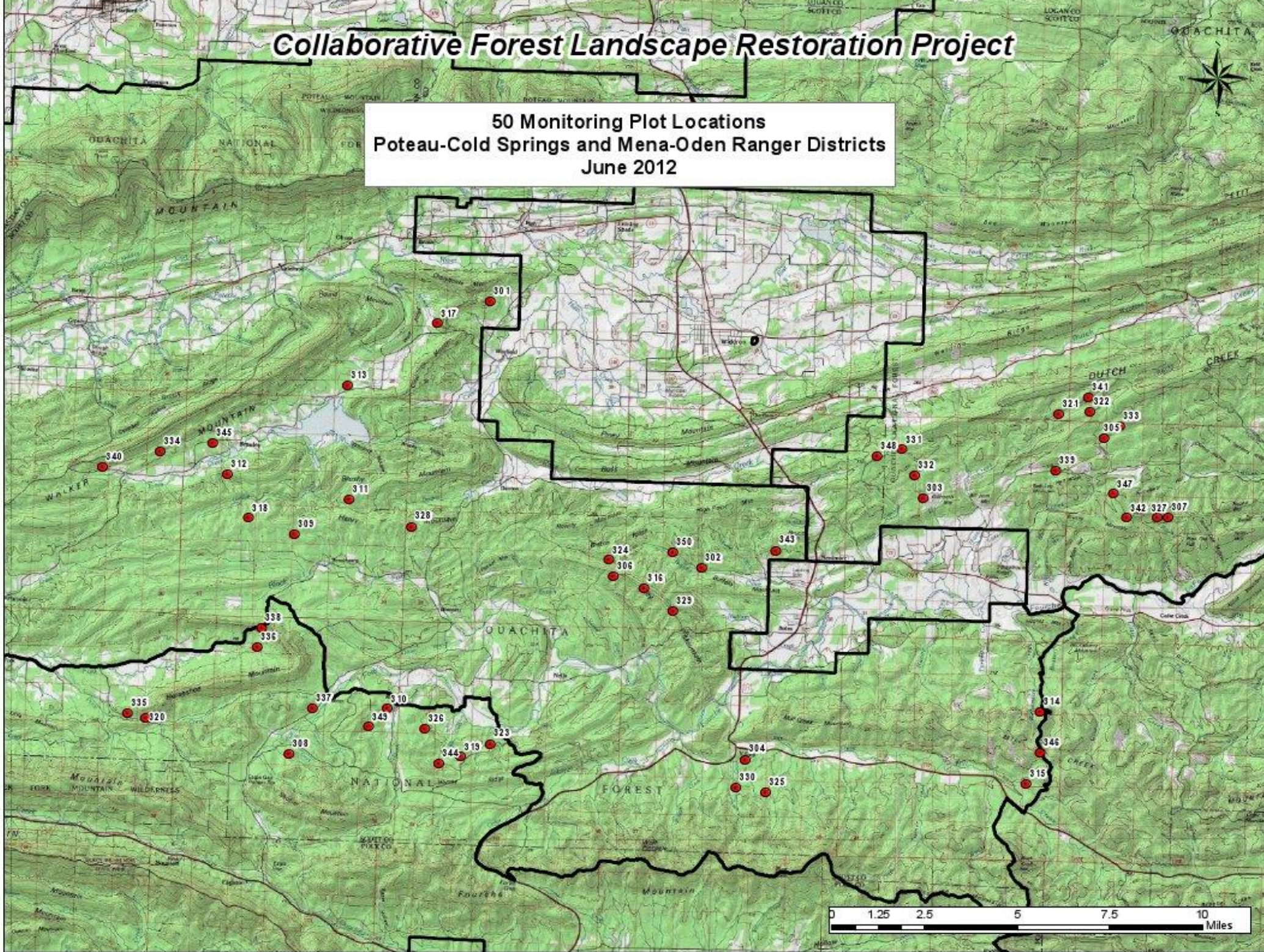
# Demo Sites -Restoration Works!





# Collaborative Forest Landscape Restoration Project

50 Monitoring Plot Locations  
Poteau-Cold Springs and Mena-Oden Ranger Districts  
June 2012







# Restored Fire Regime (Frequency/Seasonality)



Photo: LBL, KY by Jim McCoy

# Restored Ecosystem = Healthy System

**Reduced Fuels**

**Herbaceous Diversity - 100- 150 species/ acre**

**Tree Density - 38-76 trees/ acre**

# *Multiple Projects Ongoing.....*

- **Landscape-Scale NEPA -HAPPY Bat Project 80,000 Acres**
  - *Scoping Letter is out – Appealed!!*
  - *7,000 Acres Woodlands YR*
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# Gene Rush Wildlife Management Area

## Habitat Management



# Current Condition

RX burn 5000 Acres

Treat 200 acres of  
Invasive species

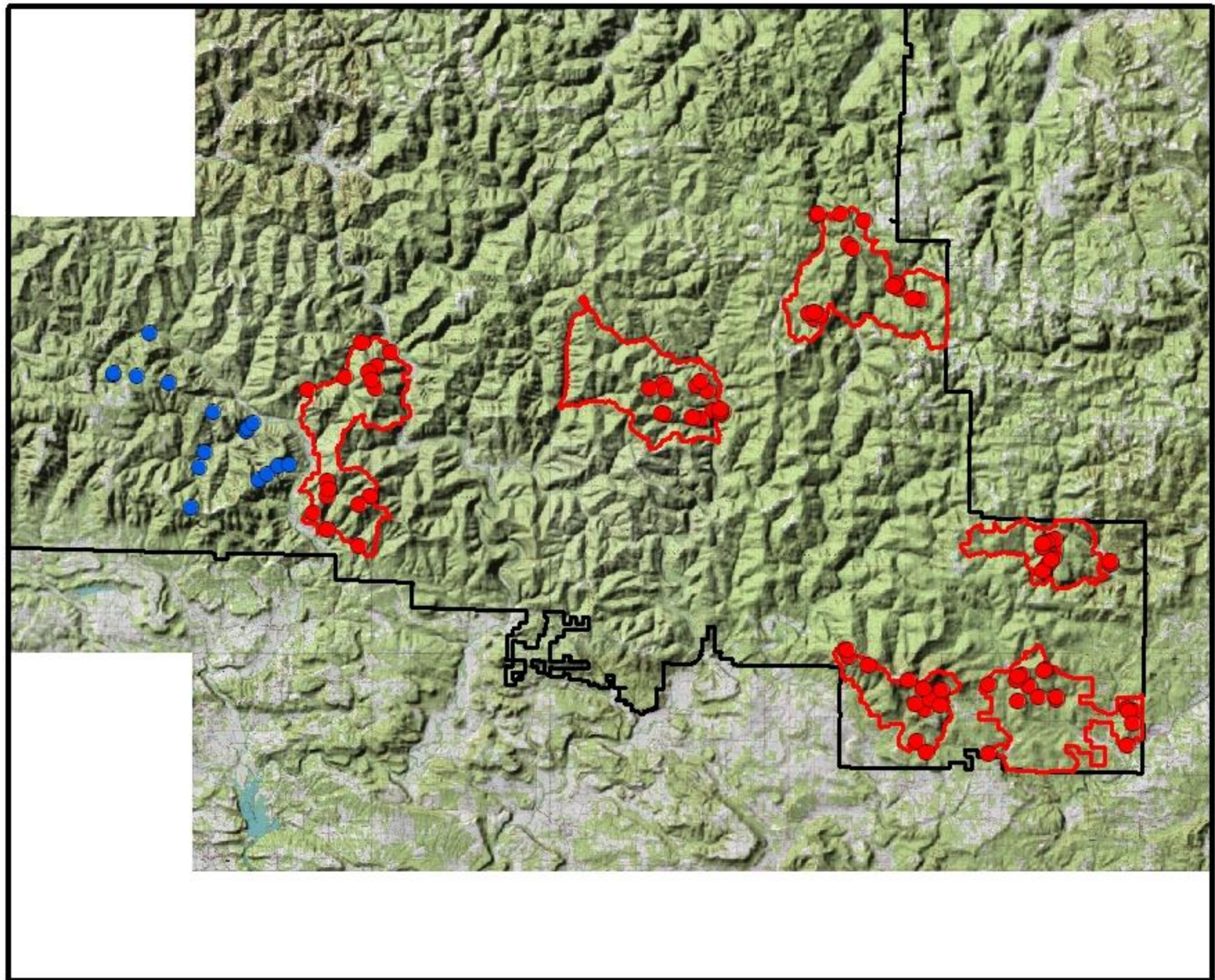






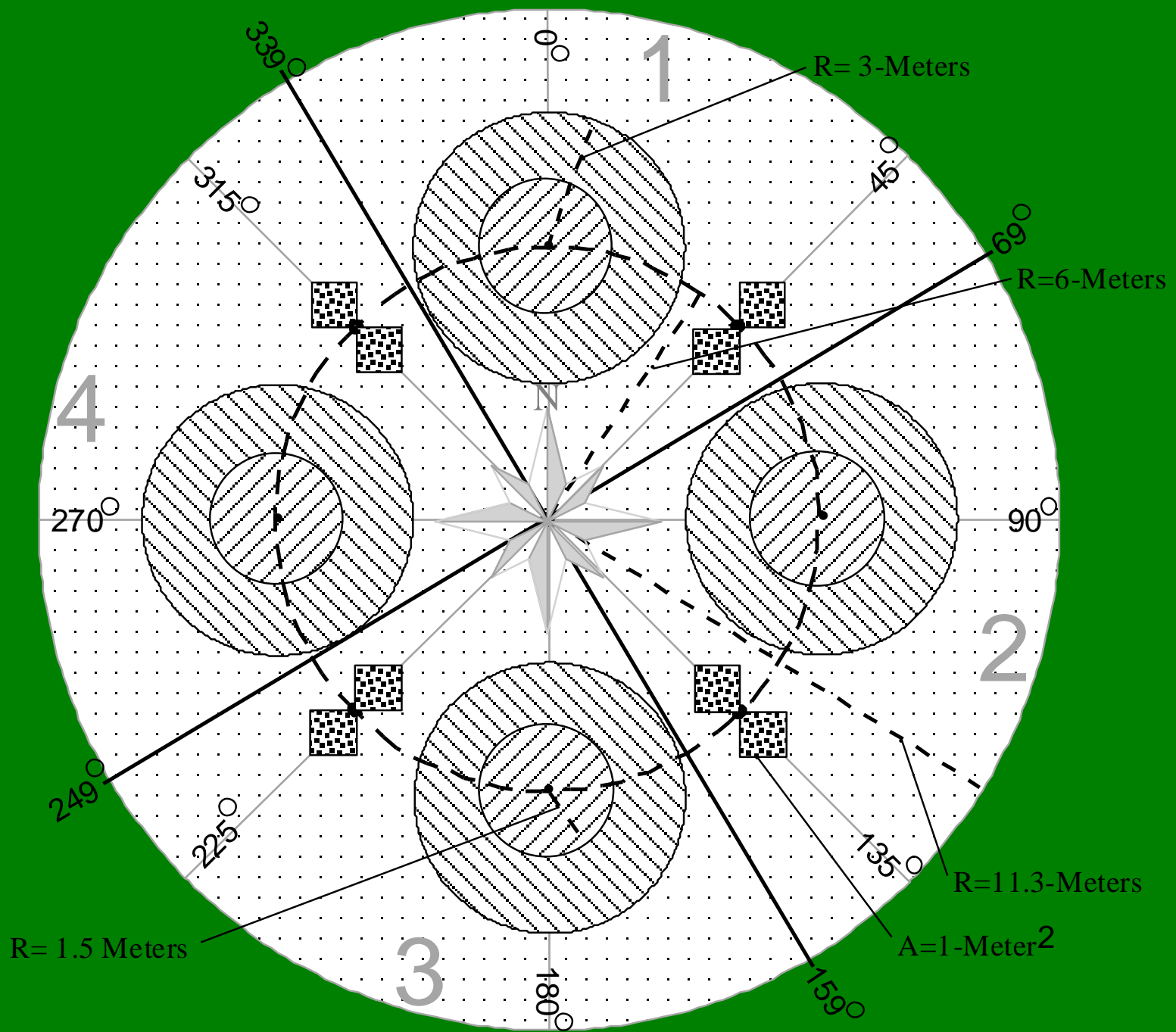


# Ozark National Forest Macro-Plots



Pleasant Hill RD (blue) Big Piney RD (red)

0 1.25 2.5 5 7.5 10 Miles



<b>LEGEND</b>			
	Plot Centers		Shrub Plot
	Herb Plot		Tree Plot
	Seedling Plot		Plot Quarters

# Landscape-scale Monitoring - It takes Partnerships



# *Post Fire Effects – 3 burns*



# *“Is our Fire Regime Appropriate??”*

Frequency/Seasonality

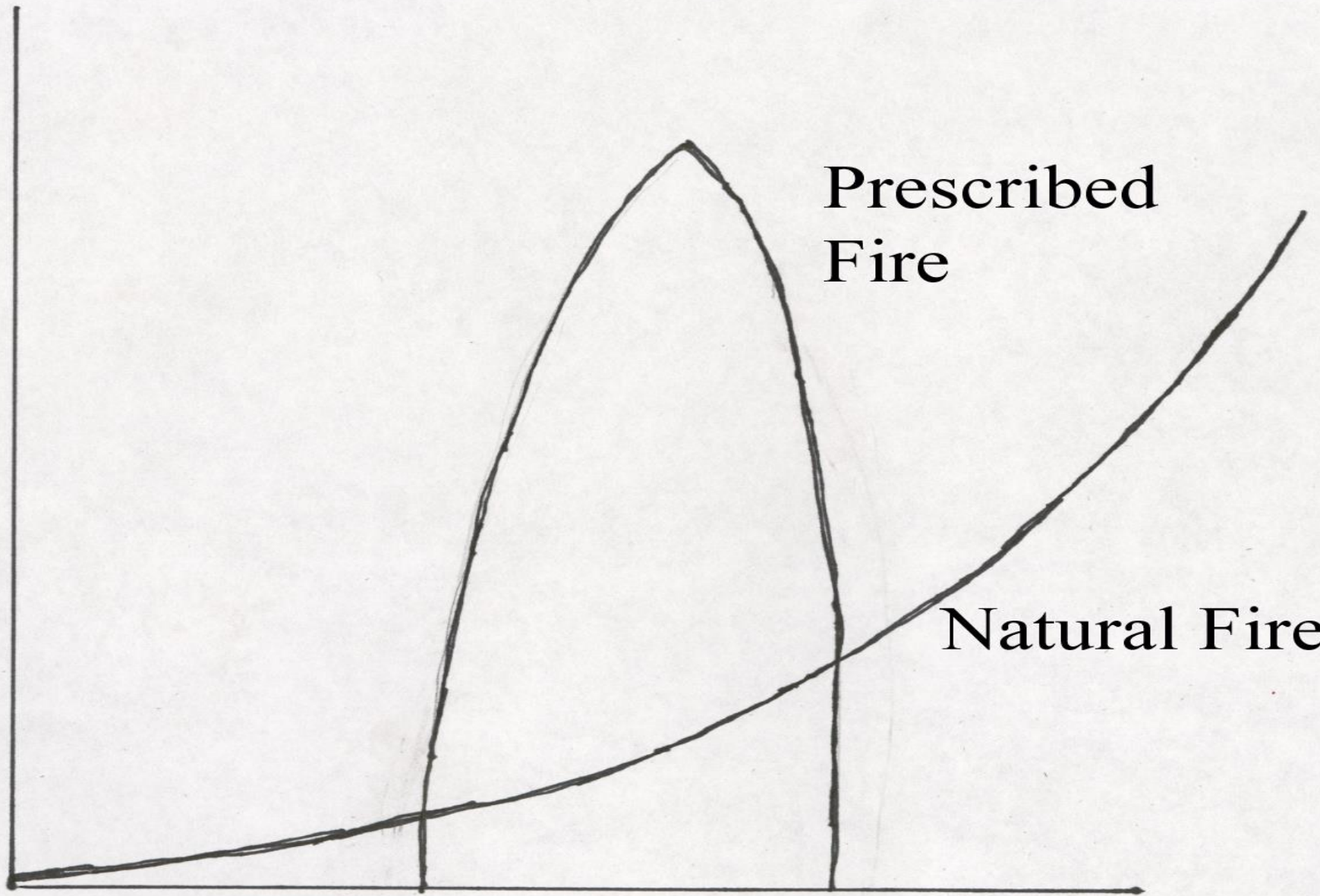
Hot/  
Dry

Prescribed  
Fire

Natural Fire

Cool/  
Wet

Acres Burned



*“Is our Fire Regime Appropriate??”*









# Questions ?

Photo: Oak Woodlands, Bayou Ranger District, John Andre

# Private Lands



# Challenging Ecosystem!



# Fire Management Issues!



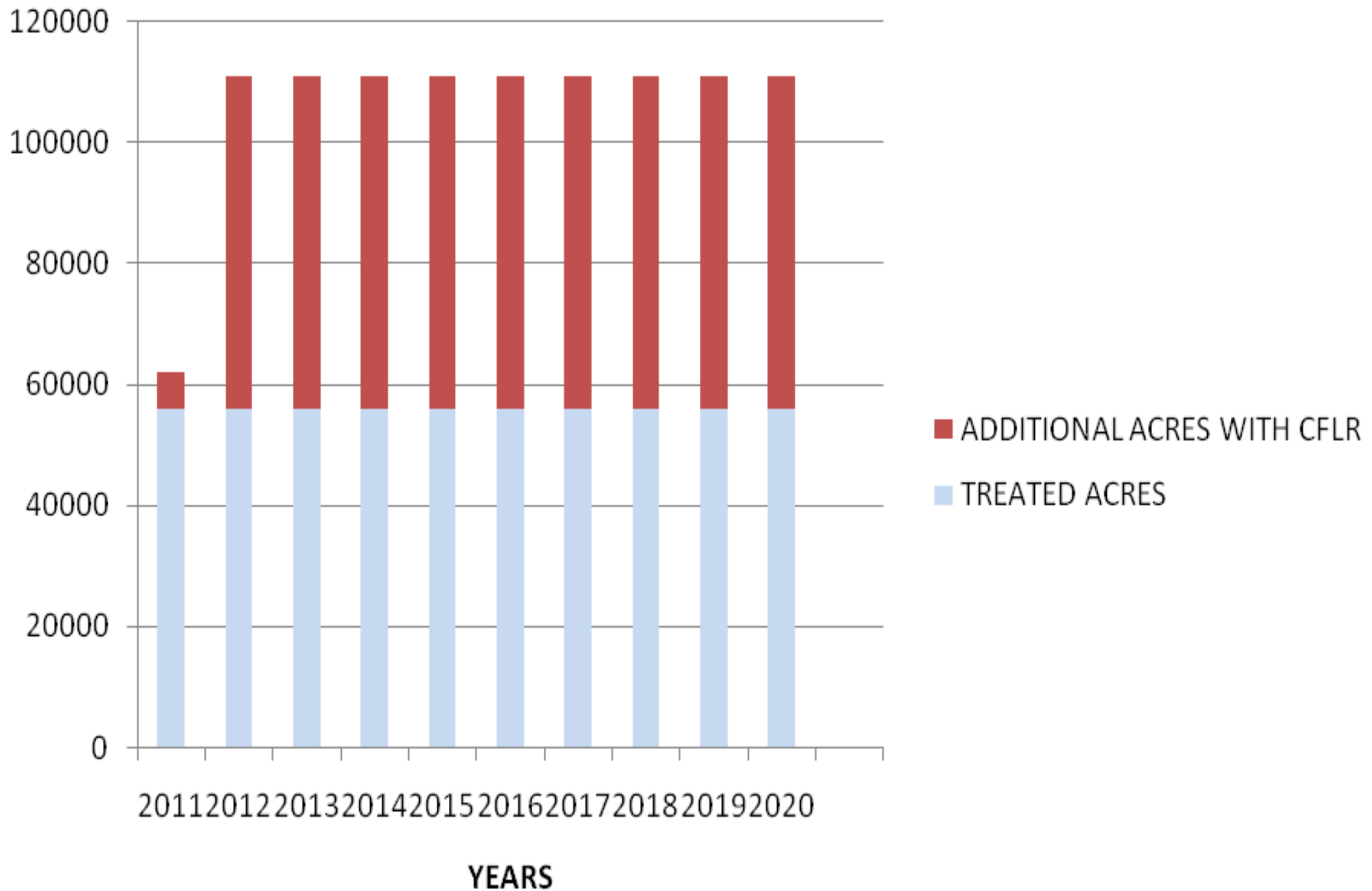
# Fire Management Issues!



# Regeneration Issues!

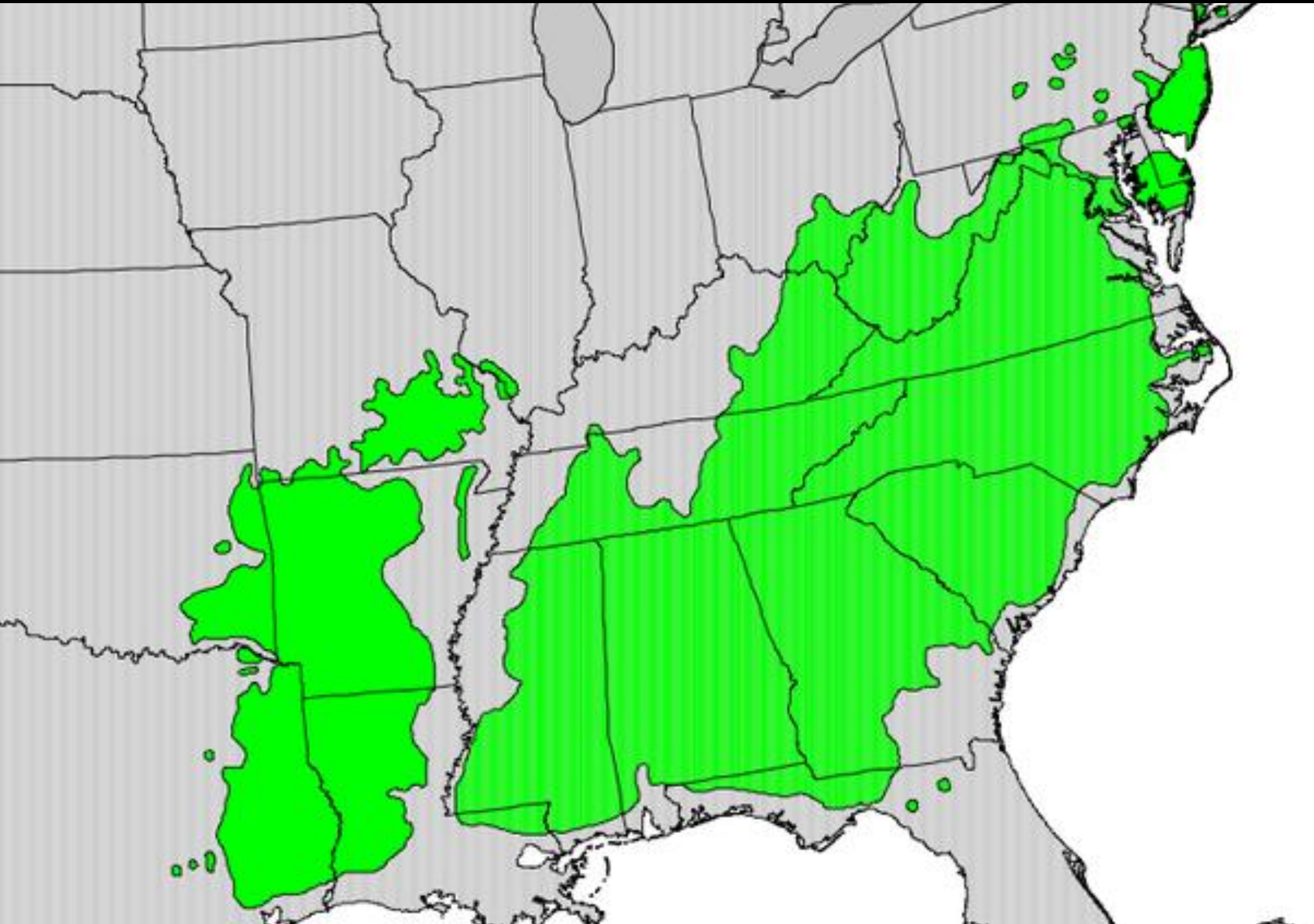


# PROJECTED ACREAGE WITH CFLR





# *Range of Shortleaf Pine (23 States)*



*Liatris pycnostachya*



*Castilleja coccinea*



*Mimosa quadrivalvis*  
ssp. *nuttallii*



*Echinacea pallida*



*Silphium laciniatum*



*Asclepias tuberosa*

